METROLOGY INTEROPERABILITY CONSORTIUM
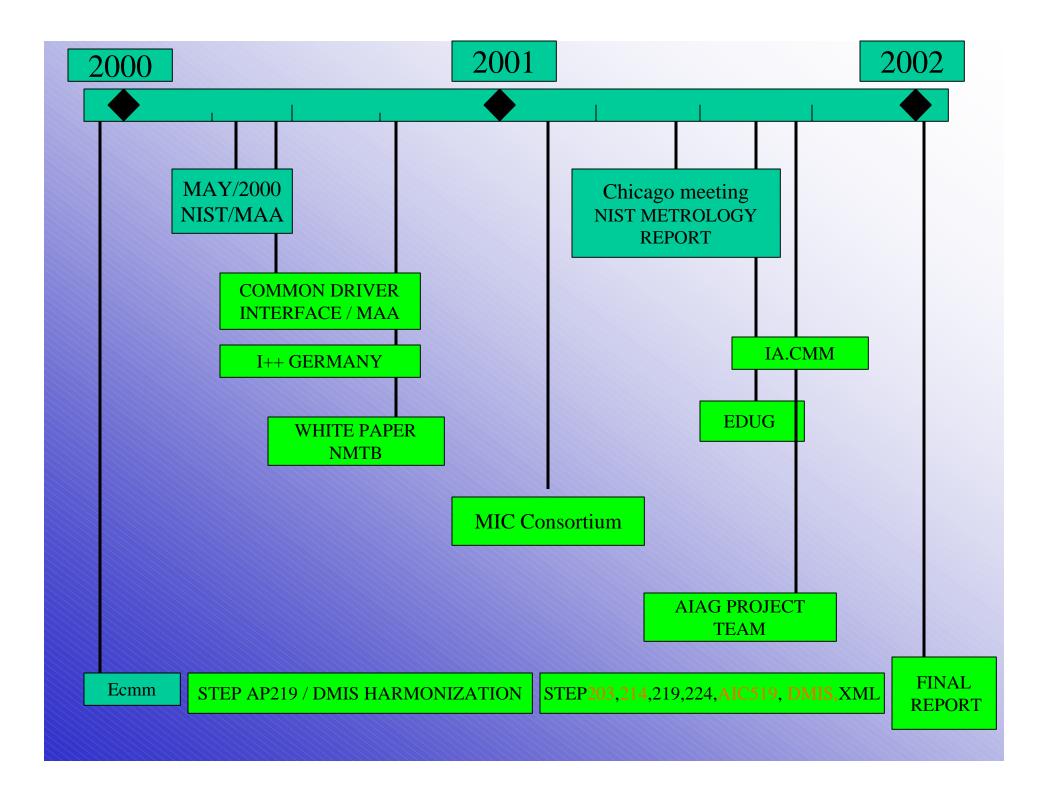## AUGUST 29,2001   COBO CENTER

R.D.Waite   Manager:Advanced Metrology Group, DaimlerChrysler

AGENDA:

8:30 – 9:00   Introductions and opening remarks   R.D.Waite, DaimlerChrysler

9:00 – 9:30   "AIAG Work Team Proposal"
                                  R.D.Waite, DaimlerChrysler
                                  Akram Yunas, Automotive Industry Action Group

9:30 - 10:25   "CAD/GD&T Data Standards"   Thomas Hendrix, Boeing

10:25 - 10:45   Coffee Break

10:45 – 11:15   "DMIS Application Profiles and Conformance Testing"
                                  Curtis Brown, Honeywell
11:15 - 11:45   "Common Data Formats /XML"   Sean Bradley, Tecnomatix

11:45 - 12:00   Work Team Formation

12:00 – 1:00   Lunch

1:00 – 3:00   Break Out Sessions   (Include a 15 minute break)

3:00 – 4:00   Action Items / Close

Corporate Involvement

- Lockheed Martin
- Carl Zeiss
- Caterpiller
- LK Metrology
- Michigan Metrology
- Naval Warfare Assesment
- Research Triangle Institute
- Xygent Inc.
- Crown & Associates
- Perceptron Inc.
- Fabreeka
- Automated Precision
- Silma
- UNC Charlotte
- UofM Dearborn
- Renishaw
- SMX Laser Trackers
- Wagner Sales
- McMaster University

- NIST
- Boeing
- GE Gas Turbine
- GE Aircraft Engines
- Brunsen Instruments
- Honeywell
- Wenzel America
- QMC
- Delmia
- Daimler Chrysler
- Ford
- Brown & Sharpe / Hexagon
- International Metrology Systems
- Origin International
- Veridian
- Tecnomatix

Automotive Industry Action Group (AIAG)

1500 Member Companies
Distribution to 96,000

AIAG Efforts:
QS9000
Bar Code
SASIG
Federal Tire Regulations
EDI
PDM
Supply Chain
Collaborative Engineering & Product Development

Aligned with
PDES Inc.
JAPA
JAMIA
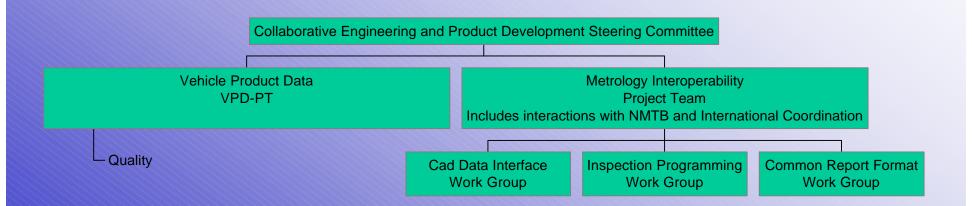ODETTE
GALLIA

AIAG PROPOSAL

- Project Team / Work Groups

- Full Funding

- Program Management

- Specialist / Administrative Support

- Use of AIAG Facilities

- Requires AIAG Membership
    - Membership List Available
    - Cost based off Corporate Sales

Proposed Organization

Collaborative Engineering and Product Development Steering Committee

Vehicle Product Data
VPD-PT

Metrology Interoperability
Project Team
Includes interactions with NMTB and International Coordination

Quality

Cad Data Interface
Work Group

Inspection Programming
Work Group

Common Report Format
Work Group

Strategic Automotive Product Data Standards Industry Group (SASIG)

From AIAG –
James Cleland, DaimlerChrysler
Paul Ekholm, DaimlerChrysler
David Francis, International
TechneGroup, Inc.
James Kindrick, ERIM
Thomas Phelps, ERIM
Steven Wingrove, Ford Motor
Company
Doug Cheney, International
TechneGroup, Inc.
Jeff Talbert, International
TechneGroup, Inc.
From GALIA–
Fréderic Chambolle, PSA Peugeot
Citroën
Louis Fort, Renault
Pierre Germain-Lacour, PSA Peugeot

- From JAMA and JAPIA –
- Masazumi Itoh, calsonicKansei
- Hidetaka Motooka, Stanley
- Kazuharu Taga, Honda
Engineering
- Syunichi Takigishi, Honda
- Takamasa Tanaka, Nissan
- Tokiyushi Tomita, Toyoda-
gosei
- Masufumi Toho, Mazda
- Kazuhiko Yamashita,
Mitsubishi
- Nobuhiro Yoshizawa, Toyota
- From VDA –
- Lutz Völkerath, Hella
- Hartmut Steins, Pierburg AG
Citroën
- Oscar Rocha, Renault
- François Desnoyer, Renault
- Michel Genouille, Usinor
- Christian Jacquot, Faurecia
- Bernard Osiowski, Faurecia
- Philippe du Rivault, GALIA

Issues / Concerns

Proposal:

Establish an agreement between non-automotive
industry / organizations currently involved
in standards activities

Other Issues?

AGENDA:

8:30 – 9:00   **Introductions and opening remarks   R.D.Waite, DaimlerChrysler**

Video

9:00 – 9:30   **"AIAG Work Team Proposal"**
                          R.D.Waite, DaimlerChrysler
                          Akram Yunas, Automotive Industry Action Group

9:30 - 10:00   **"CAD/GD&T Data Standards"   Thomas Hendrix, Boeing**

10:00 - 10:15   **Coffee Break**

10:15 – 10:45   **"DMIS Application Profiles and Conformance Testing"**
                          Curtis Brown, Honeywell

10:45 - 11:15   **"Common Data Formats /XML"   Sean Bradley, Tecnomatix**

11:15 - 11:45   **Work Team Formation**

12:00 – 1:00   **Lunch**

1:00 – 3:00   **Break Out Sessions   (Include a 15 minute break)**

Work Groups

- Objectives:
  - Identify particpants
  - Identify a sub-committee chair (tentative)
  - Mission Statement
  - Scope of Work
  - Deliverables
    - Test Specifications for NMTB
    - Interoperability Guidelines

CAD Data Flow

Design Data

- Chris Garcia – Xygent
- Glen Allan/John Plonka – Ford
- Rich Knebel – Zeiss
- Jeff Walker – LK
- Simon Frechette – NIST
- Elsayed Orady – U of M Dearborn
- Hari Sannareddy – CAT

Design Data

- Including tolerances and features

Coordinate with AIAG

- June/July timeframe
- Tom Hendrix (Boeing) invited

MIC Letterhead

- Develop before sending letter to CAD

Letter to CAD vendors

- #1 concern by companies in attendance
- Written and sent by Consortium (MIC) management.
- After June/July meeting with AIAG

Get input from Boeing

- Tom Hendrix to see where we stand today with tolerancing and STEP protocols (AP203,214,224 …)

Create Roadmap

- Each group to create roadmap to be used for overall map and tool with funding issues (after #1 before #3)

Funding

- Development of feature tolerance output spec

Correctly define problem

- In proper terminology (output of coordination w/AIAG)

International Coordination

International coordination

- AIAG: coordination of XML standards – now OASIS (S. Europe mfgs), UNCEFACT – will use SAE to certify s/w products for U.S. auto industry (Jim Tishkowski, DCX)

- European consortium dealing w/non-contact sensors (sensor mfg and CMM vendors) – meet every ~4 wks (Felix Hoben, Otto Boucki, Carl Zeiss)

- I++: overlap w/AP219 and all other projects, may organize through VDA (Gerd Becker, DCX AG)

- ISO TC184/SC1 (DMIS, STEP-NC) US has not participated in SC1 in last 4-5 yr. US representation on SC1 will be NC people (Neal Laurance)

- European DMIS User Group (Gerd Becker)

- International Association of CMM/metrology suppliers (new) supporting intl stds in metrology (training, software, service qualification, user interfaces) I++ provides input, IA.CMM responds – legal consortium, members (Felix Hoben)

- Canadian metrology association (should be invited) (Bob Waite)
- Japan?? Korea, China - Mitutoyo and Zeiss (Plonka: Mazda, Steve Scigliano will check out)

Questions

- Should there be a separate ISO TC184 Metrology Subcommittee? How to influence international standards?

- Is the Consortium international?

  A: North America with international ties and coordination.

Actions

- Get contacts

- Make them aware of this activity

- Invite participation in meetings

- Address issue of US participation in ISO TC184

Participants

Clay Tornquist

Gerd Becker

Steve Scigliano

Jim Tishkowski

Neal Laurance

Felix Hoben

Al Wavering

Inspection Programming

Inspection Programs

Coordinate with the DNSC on the following items:

High need for conformance testing done by the DNSC
Define conformant classification possibilities:

dual arm

multi carriage

scanning

rotary table

post

processors

pre

processors

laser scanning

vision

- Test procedures
- Come up with routines to verify different levels of DMIS compliancy that include artifacts and third party checks
- IVF part suggested to be used for testing. (Part contains contoured surfaces, sheet metal, and prismatic features). Artifact for training, testing, etc. Part has known deviations to be compared to print.
- Chrysler part also suggested
- Harmonization issues need to be addressed between Step AP219 and DMIS 4.0

Common Data Formatting

Measurement Data Sub-Committee
NMTB   5/22/01

**Specify requirements data flow (output / input) and content
of measured data structures.
Conformance with XML or other standards**

- **Moving data out of the data acquisition device**
  - Data out of originating device
  - Mirror of input (CAD model or SPEC file)
  - Data record, (xyz ijk)
  - Comp. Tables, APP/vector, RET vector
    - thermal comp / tip comp / Name and label
  - Allow for missing data / records (X only, Y only)

- **Data pre-processing - how to evaluate the chain?**
  - Filters / raw
  - Pre-filter (mechanical or software)/ analysis filter
    feature re-construction method
- **Optical metrology**
  - systems touch probe / light / laser / image
  - Uncertainty / per point per axis

Measurement Data Sub-Committee
NMTB   5/22/01

- **Feature data (hole / pin / plane / slot)**
Information (Final geometric construction), raw data (xyz, ijk),
uncertainty , machine dependant data

- **External system factors** (feature data) need to know what it is?
  Job of the record
  - Original feature
  - Planning / QA plan
  - Database development
  - Schema
- Leverage work of other groups / teams

<u>Goals: conformance tset</u>
- Re-analysis
- Database storage and Data schema
- Spc
- Results
- Uncertainty

Action Items   8/29/01

- Set up meeting with John Fischell
    - Measurement Science Director Surface Warfare Center Corona division
- Establish agreement between non automotive organizations
    - (ie: AIAA) & AIAG / project team
- Clarify roles of MAA , I++, IA.CMM / Project Team
- General DMIS compliance central standards / work group
- Documentation for DML / Joe Schaefer
- Next AIAG meeting , discuss flexibility of participants (focus group / technical adviser)
- Distribute all presentations / Don Duncan / AL Wavering
- Hold meeting concerning the MAA role with Key players/ MAA / AIAG / Europe
- Develop a .ppt on ROI for involvement / project team/AIAG/ Navy / Jean Czopek
- Condense final work request to group for input / Glen Allan
- Submit requests at Sept 5 meeting @ AIAG
- URL will be in minutes / phase out of NIST web site into AIAG / NIST / Veridian
- Project Team to develop timing chart / swag milestones
- Press AIAG to recruit GM / others when a SOW is established
- Discuss next steps with Akram Yunas
- Develop a roadmap (Standards Infrastructure)